

ABSTRACT

In an oxide dispersion strengthened martensitic steel which comprises, by % by weight, 0.05 to 0.25% C, 8.0 to 12.0% Cr, 0.1 to 4.0% W, 0.1 to 1.0% Ti, 0.1 to 0.5% Y_2O_3 with the balance being Fe and unavoidable impurities and in which Y_2O_3 particles are dispersed in the steel, by adjusting the Ti content within the range of 0.1 to 1.0 % so that an excess oxygen content Ex.O in steel satisfies $[0.22 \times \text{Ti (\% by weight)} < \text{Ex.O (\% by weight)} < 0.46 \times \text{Ti (\% by weight)}]$, the oxide particles are finely dispersed and highly densified to thereby obtain an oxide dispersion strengthened martensitic steel excellent in high-temperature strength. It is also possible to reduce the amount of oxygen contamination in steel during the mechanical alloying of raw material powders to provide Ex.O within a predetermined range, by carrying out the mechanical alloying in an Ar atmosphere having a super purity of not less than 99.9999%, by reducing stirring energy during the mechanical alloying or by using a metal Y powder or an Fe_2Y powder in place of the Y_2O_3 powder.